SECTION 08110

STEEL DOORS AND FRAMES

PART 1 - GENERAL

1.01 SUMMARY

A. Section Includes
1. Provision of fire rated and non-fire rated flush steel doors for interior and exterior locations.
2. Provision of steel frames for interior and exterior doors and interior windows.

B. Products Installed but not Furnished Under this Section
1. Section 08710 - Finish Hardware: Furnishing of finish hardware.

C. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

D. Related Sections
1. Section 08212 - Flush Wood Doors: Provision of flush wood doors.
2. Section 08800 - Glazing: Provision of glass and glazing.
3. Section 09100 - Metal Support Assemblies: Provision of metal framing.
4. Section 09900 - Paints and Coatings: For field painting primed doors and frames.

1.02 REFERENCES

A. ANSI - American National Standards Institute
1. A224.1 - Test Procedure and Acceptance Criteria for Prime Painted Steel Surfaces for Steel Doors and Frames.

B. ASTM - American Society for Testing and Materials
1. A153 - Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware.
2. A366 - Standard Specification for Steel, Carbon, Cold-Rolled Sheet, Commercial Quality.
3. A525 - Standard Specification for General Requirements for Steel Sheet, Zinc Coated (Galvanized) by the Hot-Dip Process.
4. A526 - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) by the Hot-Dip Process, Commercial Quality.
5. A568 - Standard Specification for General Requirements for Steel, Sheet, Carbon and High-Strength, Low Alloy, Hot-Rolled and Cold Rolled.
6. A569 - Standard Specification for Steel, Carbon (0.15 Maximum, Percent) Hot-Rolled Sheet and Strip, Commercial Quality.
7. A642 - Standard Specifications for Steel Sheet, Zinc-Coated (Galvanized) by the Hot-Dip Process, Drawing Quality, Special Killed.
8. E152 - Test Methods for Fire Tests of Door Assemblies.
9. E336 - Standard Test Method for Measurement of Airborne Sound Insulation in Buildings.

C. DHI - Door and Hardware Institute

1. RL - Recommended Locations for Builder's Hardware on Standard Steel Doors and Frames.

D. NFPA - National Fire Protection Association
1. 80 - Fire Doors and Windows.

E. SDI - Steel Door Institute
1. 100 - Recommended Specifications Standard Steel Doors and Frames.
2. 105 - Recommended Erection Instructions for Steel Frames.
3. 112 - Galvanized Standard Steel Doors and Frames.
4. 117 - Manufacturing Tolerances Standard Steel Doors and Frames.

F. UL - Underwriters Laboratories, Inc.

1.03 SUBMITTALS

A. Product Data: Submit product data for each type of door and frame specified, including details of construction, materials, dimensions, hardware preparation, core, label compliance, sound ratings, profiles and finishes.

B. Shop Drawings: Submit shop drawings showing fabrication and installation of standard steel doors and frames referenced to the Architect's door mark and hardware group. Include details of each frame type, elevations of door design types, conditions at openings, details of construction, location and installation requirements of door and frame hardware and reinforcements, and details of joints and connections. Show anchorage and accessory items.
1. Provide schedule of doors and frames using same reference numbers for details and openings as those on the Contract Drawings.
2. Indicate coordinate of glazing frames and stops with glass and glazing requirements.

1.04 QUALITY ASSURANCE

A. Regulatory Requirements
1. Provide fire rated door assemblies that comply with NFPA 80, are identical to door and frame assemblies whose fire resistance characteristics have been determined in accordance with ASTM E152 and which are labeled and listed by UL or Intertek Testing Agency.
2. Oversized Fire Rated Door Assemblies: For units exceeding sizes of tested assemblies, provide manufacturer's certification that doors conform to standard construction requirements of tested and labeled doors for rated door assemblies except for size.

1.05 DELIVERY, STORAGE, AND HANDLING

A. Acceptance at Site
1. Deliver doors and frames cardboard-wrapped or crated to provide protection during transit and job storage.
2. Inspect doors and frames upon delivery for damage. Minor damages may be repaired provided refinished items are equal in all respects to new work and acceptable to the Architect; otherwise, remove and replace damaged items as directed.

B. Storage and Protection: Store doors and frames at building site under cover. Place units on minimum 4 inches high wood blocking. Avoid use of non-vented plastic or canvas shelters

which could create humidity chamber. If cardboard wrapper on door becomes wet, remove carton immediately. Provide 1/4-inch spaces between stacked doors to promote air circulation.

PART 2 - PRODUCTS

2.01 MANUFACTURERS

A. Acceptable Manufacturers: Republic Builders Products; Steelcraft Manufacturing Co., or equal.

2.02 MATERIALS

A. Hot-Rolled Steel Sheets and Strip: Commercial quality carbon steel, pickled and oiled, complying with ASTM A569 and ASTM A568.

B. Cold-Rolled Steel Sheets: Commercial quality carbon steel, complying with ASTM A366 and ASTM A568.

C. Galvanized Steel Sheets: Zinc-coated carbon steel sheets of commercial quality, complying with ASTM A526, or drawing quality, ASTM A642, hot dipped galvanized in accordance with ASTM A525 with A60 or G60 coating designation, mil phosphatized.

D. Supports and Anchors: Fabricate of not less than 18 gauge sheet steel; galvanized where used with galvanized frames.

E. Inserts, Bolts, and Fasteners: Manufacturer's standard units. Where items are to be built in at exterior walls, hot-dip galvanize in compliance with ASTM A153, Class C or D as applicable.

F. Shop Applied Paint: Apply after fabrication.
   1. Primer: Rust-inhibitive enamel or paint, either air-drying or baking, suitable as a base for specified finish paints complying with ANSI A224.1.

G. Finish: As specified in Section 09900 and refer to Finish Schedule Sheet 9.00.

2.03 DOORS

A. Provide metal doors of SDI grades and models specified below or as indicated on the Drawings or schedules:
   1. Interior Doors: Provide doors complying with requirements indicated below by referencing ANSI 250.8 for level and model and ANSI A250.4 for physical endurance level:
      a. Level 1 and Physical Performance Level C, (Standard Duty), Model1 (Full Flush).
      b. Level 2 and Physical Performance Level B (Heavy Duty), Model 1 (Full Flush).
   2. Exterior Doors: Provide doors complying with requirements indicated below by referencing ANSI A250.8 for level and model and ANSI A250.4 for physical-endurance level:
      a. Level 3 and Physical Performance Level A (Extra Heavy Duty), Model 1 (Full Flush).
   3. Door Louvers: Provide sightproof stationary louvers for interior doors where indicated, constructed of inverted V-shaped or Y-shaped blades formed of 24 gauge cold-rolled steel set into minimum 20 gauge steel frame.

B. Door Cores
   1. Core Stiffeners: Vertical steel stiffeners or steel channel grid.
   2. Core Filler
      a. Sound deadening mineral composition, incombustible, moisture resistant, chemically inert in accordance with reviewed manufacturer's recommendations.
      b. Fire Resistive: Labeled door core material shall conform to requirements of labeling authority.

C. Frames
   1. Provide metal frames for doors and windows of types and styles as indicated on the Drawings and schedules. Conceal fastenings, unless otherwise indicated.
      a. Interior: Fabricate fully welded frames of minimum 18 gauge cold-rolled steel.
      b. Exterior: Fabricate fully welded frames of minimum 14 gauge hot-rolled steel and galvanized.
   2. Door Silencers: Except on weather-stripped and smoke gasketed frames, drill stops to receive 3 silencers on strike jambs of single door frames and 2 silencers on heads of double door frames.

D. Hardware: As specified in Section 08710.

E. Glass and Glazing: As specified in Section 08800.
   1. At interior sound-rated windows, provide laminated glass as specified in Section 08800.

2.04 FABRICATION

A. Fabricate steel door and frame units to be rigid, neat in appearance and free from defects, warp or buckle. Wherever practicable, fit and assemble units in manufacturer's plant. Clearly identify work that cannot be permanently factory-assembled before shipment, to assure proper assembly at Project site. Comply with SDI 100 requirements.
   1. Internal Construction: Manufacturer's standard vertical steel stiffeners or unitized steel grid with internal sound deadener on inside of face sheets in accordance with SDI standards.
   2. Clearances: Not more than 1/8-inch at jambs and heads except between non-fire rated pairs of doors not more than 1/4-inch. Not more than 3/4-inch at bottom.

B. Fabricate exposed faces of doors and panels, including stiles and rails of nonflush units, from only cold-rolled steel.

C. Tolerances: Comply with SDI 117.

D. Fabricate frames, concealed stiffeners, reinforcement, edge channels, louvers and moldings from either cold-rolled or hot-rolled steel.

E. Fabricate exterior doors, panels and frames from galvanized sheet steel in accordance with SDI 112. Close top and bottom edges of exterior doors as integral part of door construction or by addition of minimum 14 gauge inverted steel channels.

F. Exposed Fasteners: Unless otherwise indicated, provide countersunk flat or oval heads for exposed screws and bolts.

G. Hardware Preparation: Prepare doors and frames to receive mortised and concealed hardware in accordance with final Door Hardware Schedule and templates provided by hardware supplier. Comply with applicable requirements of ANSI A115 Series Specifications for door and frame preparation for hardware.
   1. For concealed overhead door closers, provide space, cutouts, reinforcing and provisions for fastening in top rail of doors or head of frames, as applicable.

H. Reinforce doors and frames to receive surface applied hardware. Drilling and tapping for surface applied hardware may be done at Project site.

I. Locate hardware as indicated on final shop drawings or, if not indicated, in accordance with DHI RL.

J. Shop Painting: Clean, treat and paint exposed surfaces of steel door and frame units, including galvanized surfaces.
   1. Clean steel surfaces of mill scale, rust, oil, grease, dirt and other foreign materials before application of paint.
   2. Apply shop coat of prime paint of even consistency to provide a uniformly finished surface ready to receive finish paint.

K. Glazing Stops: Minimum 20 gauge steel.
   1. Provide non-removable stops on outside of exterior doors and on secure side of interior doors for glass, louvers and other panels in doors.
   2. Provide screw applied removable glazing beads on inside of glass, louvers, and other panels in doors.

2.05 FINISHES

A. Finish Painting: As specified in Section 09900. Refer to Finish Schedule Sheet 900.

PART 3 - EXECUTION

3.01 INSTALLATION

A. General: Install steel doors, frames, and accessories in accordance with final shop drawings, manufacturer's data, and as herein specified.

B. Placing Frames: Comply with provisions of SDI 105, unless otherwise indicated.
   1. Except for frames located at existing concrete, masonry or drywall installations, place frames prior to construction of enclosing walls and ceilings. Set frames accurately in position, plumbed, aligned and braced securely until permanent anchors are set. After wall construction is completed, remove temporary braces and spreaders leaving surfaces smooth and undamaged.
   2. Install fire rated frames in accordance with NFPA Standard No. 80.
   3. In metal stud partitions, install at least 3 wall anchors per jamb at hinge and strike levels. In closed steel stud partitions, attach wall anchors to studs with screws.

C. Door Installation: Fit hollow metal doors accurately in frames, within clearances specified in SDI 100.
   1. Install fire rated doors with clearances as specified in NFPA Standard No. 80.

D. Sound-Rated Assemblies
   1. Install in accordance with manufacturer's instructions and under manufacturer's supervision.
   2. Seal the shim space around frames airtight and in a manner consistent with the STC rating as indicated on the Drawings.
   3. Sound-rated assemblies may be selected for in situ verification testing of the acoustical performance in accordance with ASTM E336. Contractor shall remedy all defects.

3.02 ADJUST AND CLEAN

A. Prime Coat Touch-Up: Immediately after erection, sand smooth any rusted or damaged areas of prime coat and apply touch-up of compatible air-drying primer.

B. Final Adjustments: Check and readjust operating hardware items, leaving steel doors and frames undamaged and in complete and proper operating condition.

END OF SECTION